NON-PUBLIC?: N
ACCESSION #: 9008060114
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Beaver Valley Power Station Unit 2
PAGE: 1 OF 4

DOCKET NUMBER: 05000412

TITLE: Reactor Trip/Turbine Trip Due To Protection Relay Actuation
EVENT DATE: 07/02/90 LER #: 90-008-00 REPORT DATE: 08/01/90

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 090

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: T.P. Noonan, General Manager Nuclear Operations

TELEPHONE: (412) 643-1258

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: BA COMPONENT: XCV MANUFACTURER: W290
X IG DET W120
REPORTABLE NPRDS: Y
Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 7/02/90 at 0700 hours, with the Unit in Power Operation at 87% reactor power, a power increase to 90% was initiated. At approximately 0800 hours, Relay personnel began clearing the 345 KV Bus Backup Timer Protection associated with the main transformer to perform a calibration of Primary 345 KV Leads Secondary Backup Fault Unit (SBFU) Protection Relay, 50-J3202. Relay 50-J3202 is within a current loop inputting a signal to Differential Protection Relay 87-204. Relay 87-204 compares signals from the 345 KV distribution lines and the output of the main transformer. At 0915 hours, with the Unit at 90% reactor power, a reactor trip occurred. The reactor trip was the result of an immediate turbine/generator trip. Operations personnel utilized the Emergency

Operating Procedures to stabilize the Unit in Hot Standby. The cause for the turbine/generator trip was actuation of Relay 87-204. This relay actuated as a result of a personnel error during the calibration of relay 50-J3202. The relay technician opened a four-pole shorting switch, de-energizing one input to relay 87-204, causing actuation. The four-pole shorting switch has been identified with warning placards and mechanically prevented from opening. There were no safety implications as a result of this event. The turbine/generator immediately tripped as designed upon a loss of the main output breakers, as discussed in the Updated Final Safety Analysis Report, Section 8.0.

END OF ABSTRACT

DESCRIPTION OF EVENT

On 7/02/90 at 0700 hours, with the Unit in Power Operation (Operating Mode 1) at 87% reactor power, a power increase to 90% was initiated. At approximately 0800 hours, Relay personnel began clearing the 345 KV Bus Backup Timer Protection associated with the main transformer to perform a calibration of Primary 345 KV Leads Secondary Backup Fault Unit (SBFU) Protection Relay, 50-J3202. Primary 345 KV Leads Protection Relay 50-J3202 is within a current loop which inputs a signal to Differential Protection Relay 87-204. Relay 87-204 receives input signals from the two 345 KV distribution lines and the output of the main transformer and compares the signals. A loss of one signal signifies a loss of a 345 KV distribution line (345 KV fault). At 0915 hours, with the Unit at 90% reactor power, a reactor trip occurred. The reactor trip was the result of an immediate turbine/generator trip upon actuation of Relay 87-204. Actuation of this relay results in a trip of the turbine, the main generator output breakers, the generator exciter field breaker and the unit station service transformer breakers. Operations personnel utilized the Emergency Operating Procedures (EOP) to stabilize the Unit in Hot Standby (Operating Mode 3). Following the trip, the auxiliary feedwater pumps started as design upon low-low level in the steam generators due to the subsequent shrink. The steam driven auxiliary feedwater pump, 2FWE*P22, tripped on overspeed shortly after starting. The Maintenance Department was requested to investigate the cause of the trip and initiate required corrective actions. Additionally, source range nuclear instrumentation detector, N31, indicated high following energization after the reactor trip.

CAUSE OF THE EVENT

The cause for the turbine/generator trip was actuation of Protection

Relay 87-204. The relay actuated as a result of a personnel error during the calibration of relay 50-J3202. The relay technician opened a four-pole shorting switch, which was outside of the scope of actions required to complete the calibration of relay 50-J3202. Opening the four-pole shorting switch de-energized one input to relay 87-204, causing actuation. Available station prints clearly indicated the function of the four-pole shorting switch.

The cause for the trip of the auxiliary feedwater pump (2FWE*P22) was determined to be in the overspeed tappet assembly. The overspeed tappet assembly was found to have excess stress due to alignment of a connecting rod from the tappet assembly pawl to the trip throttle valve. This was causing premature wear and subsequent premature tripping of the auxiliary feedwater pump.

The cause for the source range nuclear instrumentation indication problem was a failed detector.

CORRECTIVE ACTIONS

The following corrective actions are planned or have been taken as a result of this event:

1. Operations personnel stabilized the Unit in Hot standby (Operating Mode 3) utilizing the Emergency Operating Procedures.

2. An investigation of this event was initiated by Substations Department personnel. A Human Performance Enhancement System evaluation is also being performed on this event.

3. Warning placards have been installed on the four-pole shorting switches alerting personnel of the potential of a unit trip if not cleared in the proper sequence.

4. An Outage Associated Relay Activities List, containing relays which are calibrated while the plant is shutdown, has been revised to include the SBFU Backup Protection Relays associated with the main generator output breakers.

5. The appropriate Relay personnel have reviewed this event and possible trip problems.

6. Disciplinary discussions have been held with the individual

involved with the incorrect operation.

7. A design modification is being reviewed to change the four-pole shorting switch to a four point terminal block.

8. The overspeed tappet assembly on the steam driven Auxiliary Feedwater Pump (2FWE*P22) was replaced. The connecting rod from the tappet assembly pawl to the trip throttle valve was shortened. Overspeed testing of 2FWE*P22 was performed to ensure correct overspeed trip operation.

9. The failed source range nuclear instrumentation detector, N31, was replaced. The new detector was calibrated and returned to service.

REPORTABILITY

This event was reported to the Nuclear Regulatory Commission at 1006 hours in accordance with 10CFR50.72. This written report is being submitted in accordance with 10CFR50.73.a.2.iv, as an event involving a Reactor Protection System (RPS) /Engineered Safety Features (ESF) System actuation.

SAFETY IMPLICATIONS

There were no safety implications to the public as a result of this event. The generator immediately tripped as design upon a loss of the main output breakers, as discussed in the updated Final Safety Analysis Report, section 8.0. The loss of one auxiliary feedwater pump has previously been analyzed in Updated Final Safety Analysis Report, Section 10.4.9. Station Emergency operating Procedures (EOP) also contain provisions, in the event of a loss of one auxiliary feedwater pump, to ensure sufficient auxiliary feedwater flow for primary system heat removal. The two motor driven auxiliary feedwater pumps remained available to supply feedwater, in addition to a main feedwater pump.

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August 1, 1990
ND3MNO:3011

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 90-008-00

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 90-008-00, 10 CFR 50.73.a.2.iv, "Reactor Trip/Turbine Trip Due to Protection Relay Actuation".

Very truly yours,

T. P. Noonan
General Manager
Nuclear Operations

TPN/sl

Attachment

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